



IT'S ABOUT TIME

Read the General Rules in the manuals and on www.soinc.org as they apply to every event.

1. **DESCRIPTION:** Teams will answer questions related to time and they may construct and bring one non-electrical device to measure time intervals between 10 and 300 seconds.
A TEAM OF UP TO: 2 **EYE PROTECTION:** #2 **IMPOUND:** Yes **APPROX. TIME:** 50 minutes
2. **EVENT PARAMETERS:**
 - a. All reference materials to be used during all parts of the competition must be secured in a 3-ring binder, so that regardless of orientation nothing can fall out. Reference materials do not need to be impounded.
 - b. Competitors may bring calculators for use only during Part II of the competition. Items needed only for Part II of the competition do NOT need to be impounded.
 - c. Competitors must not bring watches, cell phones, or other time-keeping devices into the competition room (except for those used for the calibration step outlined below).
 - d. The event supervisor must hide from view any clocks present in the competition room.
 - e. Competitors must wear eye protection during device setup and testing. Teams without proper eye protection must be immediately informed and given an opportunity to obtain eye protection if time allows.
 - f. The device and all components needed to set up, calibrate, operate and clean up, including stopwatches, water, sand, tools, and clean-up supplies, must be impounded prior to the beginning of competition. Each team may impound only one device that will be used for all time trials.
 - g. The impounded device and any storage boxes must be clearly marked with the team's school name and competition number.
 - h. The device must be designed and operated in such a way to not damage or alter the floor.
3. **CONSTRUCTION:**
 - a. Examples of acceptable non-electrical devices include water or sand glasses, simple or torsional pendulums, or oscillating springs.
 - b. Commercial counters, timepieces or their parts are not allowed. Commercial balances, scales, test tubes, beakers, graduated cylinders, etc. are not considered counters and are allowed.
 - c. The device must NOT utilize any electrical components, physiological functions (e.g. pulse rate) or chemical reactions except for a battery-operated electronic balance or scale used solely to determine mass.
 - d. The device must be constructed to contain spillage.
 - e. At impound, the device and all components must be able to fit into an 80.0 cm x 80.0 cm x 80.0 cm cube (except for clean-up supplies, tools, stopwatch, etc.) and be moveable by the competing team members without outside assistance. The device may become larger once setup for Part I.
 - f. Devices must be constructed to minimize possible impacts on other teams when running (e.g., as quiet as possible, occupies a reasonable amount of space when set up, etc.).
 - g. Event supervisors must verify that devices meet event rules. Devices that do not meet event rules must not be impounded unless modified to meet event specifications by the team before the end of the impound period.
4. **THE COMPETITION:**

Part I:

 - a. The event supervisor must pre-select a different target time (as described under **SCORING**) for each of 5 time trials. The same times must be used for all teams. Teams must not be informed of the selected intervals. Time trials must run in the order listed in the **SCORING** section.
 - b. Teams must be given 5 minutes to setup and calibrate their device. All timing devices used for this calibration must then be impounded with the event supervisor prior to the start of the timing trials.
 - c. Prior to the start of each time trial the event supervisor must notify the teams that the trial is about to start.

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- d. To mitigate human error, the event supervisor must use a timing device that produces a tone or sound indicating the interval start and stop. A stopwatch is not acceptable for this task. A computer with a program that can produce a series of beeps at the start and end of a time interval, or a prerecorded audio file that contains such beeps with a given time interval and is played to the teams is suggested. Event supervisors who do not utilize the audio files available on the National Science Olympiad website must provide teams with an example in advance of the competition.
- e. Teams must then have at least one minute to determine, calculate, and record the time from their device (to the nearest 0.1 second) and prepare for the next time trial.
- f. Teams must be allowed to interact with their devices before, during, between and after the time trials.

Part II:

- g. Teams must be given a set amount of time (20-30 minutes is suggested) to complete a written test.
 - h. Questions may be multiple choice, true-false, completion, or calculation problems.
 - i. When requested, answers must be provided in metric units with appropriate significant figures.
 - j. The competition must consist of at least one question from each of the following areas:
 - i. Time concepts (e.g., units, terminology)
 - ii. Time-related calculations (e.g., motion equations, astronomical principles)
 - iii. Time keeping devices and history (e.g., pendulums, Greenwich Observatory)
5. **SCORING:**
- a. Teams must start with 10 points per time trial (for a total of 50 possible points for Part I).
 - b. Points must be deducted from the initial 10 points as described below. The score for a trial must NOT be less than zero. There must not be any carry-over of penalty points between trials. The trial interval ranges and points deducted are:

Time Trial #	Time Interval Range	Points Deducted / ± 0.1 sec error
Trial 1	10 to 30 sec	0.4 pts per 0.1 sec
Trial 2	30 to 90 sec	0.3 pts per 0.1 sec
Trial 3	90 to 180 sec	0.2 pts per 0.1 sec
Trial 4	180 to 300 sec	0.1 pts per 0.1 sec
Trial 5	any of the above	0.1 pts per 0.1 sec

- c. The Part II written test must be worth a total of 50 points.
- d. The total of the scores from Part I and Part II, minus any penalties, must determine the winner (which is the highest scoring team).
- e. Event supervisors may disqualify any device that is operated unsafely or a team that does not comply with the rules or bring a device, resulting in 0 points for Part I. Teams must still be allowed to compete in Part II.
- f. If any material or substance splashes, spills or falls on a table or floor the team may be assessed a penalty of up to 10 points.
- g. A penalty of 15 points may be deducted from the total score if a team does not completely clean up after the competition period. The event supervisor must make every effort to inform the team of a potential penalty and provide an opportunity to remedy the situation prior to assessing a penalty.
- h. Tiebreakers: 1st - best score from Time Trial 5, 2nd - designated question from the test.

Recommended Resources: All reference and training resources including the **It's About Time DVD (TIMD)** and the **Chem/Phy Sci CD** are available on the Official Science Olympiad Store or Website at <http://www.soinc.org>

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